

CLAIMS

What is claimed is:

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1. A method of adding packet ordering information to a plurality of data packets comprising:  
applying error detection to each of the plurality of data packets; and  
masking each of the plurality of data packets, the masking being performed using a plurality of ordering masks in a known order.
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2. The method of claim 1 wherein masking comprises exclusive or'ing each of the plurality of data packets with a corresponding one of the plurality of ordering masks.
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3. The method of claim 1 wherein each of the plurality of data packets is masked with one of the plurality of ordering masks, the plurality of ordering masks and the known order being known by a receiver such that the receiver can discern a relative packet order using the plurality of ordering masks.
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4. The method of claim 1 wherein the plurality of ordering masks comprises cryptographic keys.
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5. The method of claim 1 wherein the plurality of ordering masks are masks other than cryptographic keys, the method further comprising prior to applying error detection, encrypting each of the plurality of data packets.
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6. The method of claim 1 wherein:  
the plurality of data packets are to be transmitted in a network having a maximum latency variability; and  
the plurality of ordering masks includes a sufficient number of ordering masks for a receiver to identify a correct order of two packets received out of order and received a distance apart in time less than or equal to the maximum latency variability.

7. A method of determining a packet order of a received packet comprising:

applying at least one ordering mask to the received packet in a known order from a list of ordering masks to find a current ordering mask that was previously used to mask the received packet; and

when at least one older ordering mask exists in the list of ordering masks, the at least one older ordering mask occurring earlier in the known order than the current ordering mask, removing the at least one older ordering mask from the list of ordering masks.

8. The method of claim 7 wherein applying comprises:

applying a first ordering mask to the received packet to produce a first unmasked received packet;

checking the first unmasked received packet for errors; and

when errors in the first unmasked received packet are below a threshold, setting the current ordering mask to the first ordering mask.

9. The method of claim 8 wherein the received packet has had forward correction and masking applied thereto prior to transmission, and wherein checking comprises applying forward error correction.

10. The method of claim 7 further comprising:

successively applying the ordering masks that remain on the list of ordering masks to the received packet; and

when after applying all of the list of ordering masks to the received packet, the current ordering mask is not found, discarding the received packet.

11. A method of determining the transmitted order of a received packet relative to other received packets comprising:  
    setting a temporary ordering mask equal to a next ordering mask in a list of ordering masks;  
5     applying the temporary ordering mask to the received packet to produce an unmasked received packet;  
    checking the unmasked received packet for errors;  
    repeating the previous actions until no errors are found when errors are found; and  
10     setting a current ordering mask equal to the temporary ordering mask.
12. The method of claim 11 wherein the list of ordering masks is maintained in an order of packet transmission, and the current ordering mask defines a relative transmission order of the received packet.
13. The method of claim 12 further comprising:  
    if the received packet is older than a previously received packet,  
15     discarding the received packet.
14. The method of claim 12 further comprising:  
    if the received packet is not older than a previously received packet,  
20     marking the current ordering mask as a most recently used mask.
15. The method of claim 12 wherein the list of ordering masks comprises  
25     cryptographic keys.
16. A communications device comprising:  
    a packet receiver;  
    a mask store;  
30     an unmasking device coupled to the mask store and the packet receiver, the unmasking device being configured to unmask received packets;  
    and  
    an error detection device coupled to the unmasking device, the error  
35     detection device being configured to detect errors in unmasked received packets.

17. The communications device of claim 16 further comprising a controller coupled to the mask store and the error detection device, the controller being configured to evaluate error information received from the error detection device, and further configured to command the mask store to provide masks to the unmasking device.

18. The communications device of claim 17 wherein the mask store includes a plurality of masks, the plurality of masks representing an order of transmission of a plurality of packets.

19. The communications device of claim 16 wherein the mask store is a key generator capable of generating keys to decrypt encrypted packets.

20. The communications device of claim 16 wherein the mask store includes a plurality of masks, and the mask store is configured to operate as a circular buffer such that the plurality of masks is used more than once.

21. The communications device of claim 20 wherein the mask store is configured to maintain a most recent mask pointer that points to a most recently used mask.

22. The communications device of claim 16 further comprising a decryptor coupled to the unmasking device, the decryptor being configured to decrypt unmasked packets using keys received from a key generator.

23. A communications device comprising:  
a packet formatter;  
a forward error device for applying error codes to packets received from the packet formatter;  
a mask store; and  
a masking device responsive to the mask store and the forward error device.

24. The communications device of claim 23 wherein the packet formatter is a data packet formatter.

25. The communications device of claim 23 wherein the packet formatter comprises a vocoder.

5 26. The communications device of claim 23 wherein the masking device comprises an encryptor, and the mask store comprises a key generator.

10 27. The communications device of claim 23 further comprising an encryptor coupled between the packet formatter and the forward error device, wherein the encryptor is configured to receive packets from the packet formatter, encrypt the packets, and send encrypted packets to the forward error device.